anonychia congenita

Anonychia congenita is a condition that affects the fingernails and toenails. Individuals with this condition are typically missing all of their fingernails and toenails (anonychia). This absence of nails is noticeable from birth (congenital). In some cases, only part of the nail is missing (hyponychia) or not all fingers and toes are affected. All of the other tissues at the tips of the fingers and toes, including structures that usually support the nail and its growth (such as the nail bed), are normal.

Individuals with anonychia congenita do not have any other health problems related to the condition.

Frequency

Anonychia congenita is a rare condition; its prevalence is unknown.

Genetic Changes

Mutations in the *RSPO4* gene cause anonychia congenita. The *RSPO4* gene provides instructions for making a protein called R-spondin-4. R-spondin-4 plays a role in the Wnt signaling pathway, a series of steps that affect the way cells and tissues develop. Wnt signaling is important for cell division, attachment of cells to one another (adhesion), cell movement (migration), and many other cellular activities. During early development, Wnt signaling plays a critical role in the growth and development of nails. R-spondin-4 is active in the skeleton and contributes to limb formation, particularly at the ends of the fingers and toes where nail development occurs.

RSPO4 gene mutations lead to the production of a protein with little or no function. As a result, R-spondin-4 cannot participate in the Wnt signaling pathway and nails develop improperly or not at all.

Anonychia congenita can also be part of syndromes that affect multiple parts of the body, including Coffin-Siris syndrome and nail-patella syndrome. When anonychia congenita is part of a syndrome, it is caused by mutations in the gene associated with that syndrome.

Inheritance Pattern

Anonychia congenita resulting from *RSPO4* gene mutations is inherited in an autosomal recessive pattern, which means both copies of the gene in each cell have mutations. The parents of an individual with an autosomal recessive condition each carry one copy of the mutated gene, but they typically do not show signs and symptoms of the condition.

Other Names for This Condition

- absent nails
- anonychia
- aplastic nails
- congenital absence of nails
- hyponychia congenita

Diagnosis & Management

Genetic Testing

- Genetic Testing Registry: Anonychia
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C0265998/

General Information from MedlinePlus

- Diagnostic Tests
  https://medlineplus.gov/diagnostictests.html
- Drug Therapy
  https://medlineplus.gov/drugtherapy.html
- Genetic Counseling
  https://medlineplus.gov/geneticcounseling.html
- Palliative Care
  https://medlineplus.gov/palliativecare.html
- Surgery and Rehabilitation
  https://medlineplus.gov/surgeryandrehabilitation.html

Additional Information & Resources

MedlinePlus

- Encyclopedia: Nail Abnormalities
  https://medlineplus.gov/ency/article/003247.htm
- Health Topic: Nail Diseases
  https://medlineplus.gov/naildiseases.html

Genetic and Rare Diseases Information Center

- Anonychia congenita
  https://rarediseases.info.nih.gov/diseases/10048/anonychia-congenita

Educational Resources

- Disease InfoSearch: Anonychia Congenita
  http://www.diseaseinfosearch.org/Anonychia+Congenita/488
- KidsHealth from Nemours: Your Nails
  http://kidshealth.org/en/kids/your-nails.html
- MalaCards: anonychia congenita
  http://www.malacards.org/card/anonychia_congenita
- Merck Manual Consumer Version: Overview of Nail Disorders
  http://www.merckmanuals.com/home/skin-disorders/nail-disorders/overview-of-nail-disorders
- Orphanet: Isolated congenital anonychia
  http://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=79143

Patient Support and Advocacy Resources

- British Association of Dermatologists: Skin Support
  http://skinsupport.org.uk/

Scientific Articles on PubMed

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28Nails,+Malformed%5BMAJR%5D%29+AND+%28%28anonychia+congenita%5BTIAB%5D%29+OR+%28anonychia%5BTIAB%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+3600+days%22%5Bdp%5D

OMIM

- NAIL DISORDER, NONSYNDROMIC CONGENITAL, 4
  http://omim.org/entry/206800

Sources for This Summary

- Bergmann C, Senderek J, Anhuf D, Thiel CT, Ekici AB, Poblete-Gutierrez P, van Steensel M, Seelow D, Nürnberg G, Schild HH, Nürnberg P, Reis A, Frank J, Zerres K. Mutations in the gene encoding the Wnt-signaling component R-spondin 4 (RSPO4) cause autosomal recessive anonychia. Am J Hum Genet. 2006 Dec;79(6):1105-9. Epub 2006 Oct 17.
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/17186469
  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1698700/
- Blaydon DC, Ishii Y, O'Toole EA, Unsworth HC, Teh MT, Rüschendorf F, Sinclair C, Hopsu-Havu VK, Tidman N, Moss C, Watson R, de Berker D, Wajid M, Christiano AM, Kelsell DP. The gene encoding R-spondin 4 (RSPO4), a secreted protein implicated in Wnt signaling, is mutated in inherited anonychia. Nat Genet. 2006 Nov;38(11):1245-7. Epub 2006 Oct 15.
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/17041604

- Brüchle NO, Frank J, Frank V, Senderek J, Akar A, Koc E, Rigopoulos D, van Steensel M, Zerres K, Bergmann C. RSPO4 is the major gene in autosomal-recessive anonychia and mutations cluster in the furin-like cysteine-rich domains of the Wnt signaling ligand R-spondin 4. J Invest Dermatol. 2008 Apr;128(4):791-6. Epub 2007 Oct 4.
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/17914448
- Khalil S, Hayashi R, Daou L, Staiteieh SA, Abbas O, Bergqvist C, Nemer G, Shimomura Y, Kurban M. A novel mutation in the RSPO4 gene in a patient with autosomal recessive anonychia. Clin Exp Dermatol. 2017 Apr;42(3):313-315. doi: 10.1111/ced.13052. Epub 2017 Mar 1.
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/28247548
- Khan TN, Klar J, Nawaz S, Jameel M, Tariq M, Malik NA, Baig SM, Dahl N. Novel missense mutation in the RSPO4 gene in congenital hyponychia and evidence for a polymorphic initiation codon (p.M1I). BMC Med Genet. 2012 Dec 13;13:120. doi: 10.1186/1471-2350-13-120.
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/23234511
  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3532313/
- Wasif N, Ahmad W. A novel nonsense mutation in RSPO4 gene underlies autosomal recessive congenital anonychia in a Pakistani family. Pediatr Dermatol. 2013 Jan-Feb;30(1):139-41. doi: 10.1111/j.1525-1470.2011.01587.x. Epub 2012 Feb 3.
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/22300369

Reprinted from Genetics Home Reference:
https://ghr.nlm.nih.gov/condition/anonychia-congenita

Reviewed: May 2017
Published: June 27, 2017

Lister Hill National Center for Biomedical Communications
U.S. National Library of Medicine
National Institutes of Health
Department of Health & Human Services